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# Sheet 1 (Introduction)

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1. Electromagnetic and acoustic are two different imaging modalities. The source energy is passed (or reflected) through (or by) the objects to be imaged. This energy is then sensed and converted to a digital image.
  - a) Mention some applications for each modality
  - b) Choose one imaging application for each of the two modalities and give details about it.
2. Explain how the image shown below is typically produced



3. What are the two main application areas of digital image processing?
  4. There are no clear-cut boundaries in the continuum from image processing at one end to computer vision at the other. However, one useful paradigm is to consider three types of computerized processes in this continuum: low-, mid-, and high-level processes. Explain.
  5. The invention in the early 1970s of computerized axial tomography (CAT), also called computerized tomography (CT) for short, is one of the most important events in the application of image processing in medical diagnosis. Explain how the CAT image is constructed.
  6. Describe how, in general, digital images are formed.
  7. Mention some example for gamma-ray imaging
  8. Show how the X-rays are generated for the purpose of medical imaging and mention one example of the medical x-ray imaging.
  9. Explain the fluorescence microscopy as one example in Ultraviolet light imaging.
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10. Mention some application for the imaging in the visible and infrared bands
  11. One common application of microwave imaging is the radar systems. Explain how are radar image generated and mentions some application areas.
  12. Explain how images are produced using electron microscopy.
  13. Using block diagram show the main steps and components used in a general purpose digital image processing system.
  14. Explain the categories of digital storage for image processing
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